

### REMARKS

Claims 1-3, 5, 7-15, 17, and 19-25 are pending.

Claims 4, 6, 16, 18, and 26-29 have been cancelled.

In the Office Action dated April 28, 2010, claims 1-3, 5, 7, 10-15, 17, 19 and 22-25 were rejected under 35 U.S.C. § 103(a) as unpatentable over “Motion-based Segmentation Using a Threshold Merging Strategy on Watershed Segments” (de Smet) in view of “K-Harmonic Means—A Data Clustering Algorithm” (Zhang); claims 8, 9, 20 and 21 were rejected under 35 U.S.C. § 103(a) as unpatentable over de Smet in view of Zhang and further in view of “A Video Segmentation Algorithm for Hierarchical Object Representations and its Implementation” (Hermann); claim 27 was rejected under 35 U.S.C. § 103(a) as unpatentable over de Smet in view of Zhang and in view of U.S. Patent No. 6,084,912 (Reitmeier); claims 1-3, 5, and 7-12 were rejected under 35 U.S.C. § 101 because the claimed invention is directed to non-statutory subject matter.

### REJECTION UNDER 35 U.S.C. § 101

To address the § 101 rejection of independent claim 1. Claim 1 has been amended to add “non-transitory” as suggested by the Office Action.

Withdrawal of the § 101 rejection is respectfully requested.

### REJECTION UNDER 35 U.S.C. § 103

Independent claim 1 has been amended to clarify that the regression functions for each of the K clusters are to estimate motion paths in the image sequence. This amendment is made to make the “initializing” clause of claim 1 consistent with the “using” clause of claim 1. Support for this amendment of claim 1 can be found at least on page 18, ¶¶ [0085]-[0087] of the present application.

Also, to improve the form of claim 1, the phrase “distances from each data point to each of the K regression functions” has been replaced with “values representing errors between the data points and corresponding ones of the K regression functions.” Support for this amendment can be found at least on page 15, in ¶¶ [0065] and [0068], including equation 10.

It is respectfully submitted that claim 1 is non-obvious over de Smet and Zhang.

To make a determination under 35 U.S.C. § 103, several basic factual inquiries must be performed, including determining the scope and content of the prior art, and ascertaining the differences between the prior art and the claims at issue. *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 U.S.P.Q. 459 (1965). Moreover, as held by the U.S. Supreme Court, it is important to identify a reason that would have prompted a person of ordinary skill in the art to combine reference teachings in the manner that the claimed invention does. *KSR International Co. v. Teleflex, Inc.*, 127 S.Ct. 1727, 1741, 82 U.S.P.Q.2d 1385 (2007).

As recited in claim 1, values representing errors between the data points and corresponding ones of the K regression functions are calculated. Note that the K regression functions estimate motion paths in the image sequence. In the “using” clause of claim 1, the motion paths represented by the recalculated K regression functions are used if the changes in membership probabilities or changes in the K regression functions satisfy a stopping criterion.

Zhang, the secondary reference cited by the Office Action against the subject matter of claim 1 relating to K-Harmonic Means regression clustering, describes computing Euclidean distances between data points and cluster center positions  $m_k$ . From equation 5 on page 5 of Zhang, it is clear that  $m_k$  represents a geometric center position for a respective cluster  $k$ . On the other hand, the K regression functions of claim 1 estimate motion paths in an image sequence, and claim 1 recites calculating values representing errors between the data points and corresponding ones of the K regression functions. Examples of such values representing errors are provided on page 15, ¶ [0068], of the present application. As further noted in ¶ [0065] of the present application, an error function as expressed in ¶ [0065] and in equation 9 is used. Therefore, it is clear that Zhang does not provide any teaching or hint of claimed subject matter that is clearly missing from de Smet. Note that the Office Action conceded that de Smet fails to disclose performing regression clustering using a K-Harmonic Means function in the manner recited in claim 1. 04/28/2010 Office Action at 11.

Therefore, even if de Smet and Zhang could be hypothetically combined, the hypothetical combination of the references would not have led to the subject matter of claim 1. In addition, in view of the significant differences between the claimed subject

matter and the teachings of de Smet and Zhang, a person of ordinary skill in the art would have found no reason to combine the reference teachings to achieve the claimed subject matter.

Claim 1 is therefore non-obvious over de Smet and Zhang.

Similar amendments have been made to independent claims 13 and 25, and these claims are also clearly non-obvious over de Smet and Zhang.

Dependent claims are allowable for at least the same reasons as corresponding independent claims. In view of the allowability of base claims, the obviousness rejections of dependent claims have been overcome.

Allowance of all claims is respectfully requested.

The Commissioner is authorized to charge any additional fees and/or credit any overpayment to Deposit Account No. 08-2025 (200314385-1).

Respectfully submitted,

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